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Installation Requirements for Lead Acid Batteries

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Presentation Outline

Background
IEEE Std 484 Overview
CEC Requirements for Storage Batteries
Summary
Conclusions
Questions

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IEEE Std 484

Development and outline of IEEE Std 484

- **Overview**
- **References**
- **Definitions**
- **Design Criteria**
- **Installation procedures**

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IEEE Std 484 Overview

The intent of the standard is development of guidelines with respect to design and installation of vented lead-acid batteries

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IEEE References

IEEE Std 484 "IEEE Recommended Practice for Maintenance, Testing and Replacement of Vented Lead-Acid Batteries for Stationary Applications"
IEEE Std 450 "IEEE Recommended Practice for Sizing Lead-Acid Storage Batteries for Stationary Applications"
IEEE Std 100 "The Authoritative Dictionary of IEEE Standard Terms"

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Definitions found in IEEE Std 484

IEEE Std 100 "The Authoritative Dictionary of IEEE Standard Terms"
For example: Vented battery: A battery in which the products of electrolysis and evaporation are allowed to escape freely to the atmosphere

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IEEE Safety Requirements

The standard is concerned with respect to Workers Safety

Recommended Equipment

- **Goggles, face shields**
- **Acid resistant gloves**
- **Protective aprons and overshoes**
- **Water washing stations (eyes, etc)**
- **Neutralization chemicals on standby**

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Installation Design Criteria

Location
Mounting
Seismic
Ventilation
Instrumentation and alarms

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Installation Procedures

Storage
Unpacking
Storage
Assembly
Charging (rectifies)

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Canadian Electrical Safety Code

Developed installation code rules for the installation of storage batteries

The Rules were developed based on the IEEE Std 484 in order develop consistent safety measures

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Special Terminology

Sealed cell or battery means a storage battery that has no provision for the addition of water or electrolyte or for the external measurement of electrolyte specific gravity.

Storage battery means a battery comprised of more than one rechargeable cell of the lead-acid, alkaline, or other electrochemical types.

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Location of Storage Batteries

Batteries with exposed live parts shall be kept in a room or enclosure accessible only to authorized personnel.

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Ventilation of Battery Rooms or Areas

Storage battery rooms or areas shall be adequately ventilated.

Storage batteries shall not be subjected to ambient temperatures greater than 45°C or less than the freezing point of the electrolyte.

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Battery Installation

Battery trays, racks,

- **Level; and**
- **Protected against corrosion from the battery electrolyte; and**
- **Insulating material having a dielectric strength of at least 1500 V; and**
- **Of sufficient strength to carry the weight of the battery; and**
- **Designed to withstand vibration and sway where appropriate.**

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Battery Installation

Battery Cells

- **Spaced a minimum of 10 mm apart.**
- **Conductive containers shall be installed on non-conductive surfaces.**
- **Sealed cells and multi-compartment sealed batteries having conductive containers shall have an insulating support if a voltage is present between the container and ground.**
- **Cells and multi-compartment vented storage batteries, with covers sealed to containers of non-conductive, heat-resistant material**
- **Nominal voltage >150 V and with cells in rubber or composition containers shall be sectionalized into groups of 150 V or less.**

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Wiring to Batteries

The wiring between cells and batteries

- **Bare conductors which shall not be taped; or**
- **Open wiring; or**
- **A jacketed flexible cord; or**
- **Mineral-insulated cable or**
- **Aluminum-sheathed cable**

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Wiring to Batteries

Rigid conduit or electrical metallic tubing

- **Corrosion-resistant material or other materials suitably protected from corrosion; and**
- **Tightly sealed with sealing compound, rubber tape, or other material, to resist the entrance of electrolyte by spray or creeping; and**
- **The conductor shall issue from the raceway through a substantial glazed insulating bushing; and**
- **At least 300 mm of the conductor shall be free from the raceway where connected to a cell terminal; and**
- **The raceway exit shall be located at least 300 mm above the highest cell terminal to reduce electrolyte creepage or spillage entering the raceway.**

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Wiring Methods and Installation of Equipment in Battery Rooms

The installation of wiring and equipment in a battery room shall be in accordance with the requirements for a dry location.

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Summary

Correlation of IEEE Std 484 and the Canadian Electrical Safety Code

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Conclusions

IEEE Standard is a Guideline
CEC is Enforceable by most Provinces

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Questions??????????